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October 25, 1996,

VIA HAND DELIVERY
William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, DC 20554

Re: In the Matter of Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems
CC Docket No. 94-102

Dear Mr. Caton:

Transmitted herewith, on behalf of Nokia Telecomunications Inc. is an original and 10 copies of its Reply Comments in response to the FNPRM in the above-referenced docket.

Please date stamp and return one copy to be returned to us by the messenger. Please direct any questions that you may have to the undersigned.

Respectfully submitted,

Leo R. Fitzsimon

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of the Commission's Rules	)	CC Docket No. 94-102
To Ensure Compatibility with	)	RM-8143
Enhanced 911 Emergency Calling Systems	)	

REPLY COMMENTS OF NOKIA TELECOMMUNICATIONS, INC.

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October 25, 1996

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SUMMARY

Nokia Telecommunications, Inc. ("Nokia") is pleased to present these Reply Comments to the Further Notice of Proposed Rulemaking ("FNPRM") and the comments submitted by other parties in this very important proceeding. Each of these commenters supported the Commission's praiseworthy goals of improving the quality and the reliability of wireless E911 service. There was also a clear consensus on the public policy benefits of achieving these goals. The commenters expressed divergent views, however, concerning the appropriate mechanism to be employed to achieve these laudable goals.

The overwhelming majority of commenters opposed the stringent wireless automatic location information ("ALI") requirements proposed by the Commission in the FNPRM (the "FNPRM ALI Requirements"). These commenters also opposed the concept of requiring wireless carriers to accept 911 calls from any wireless user, regardless of the technology employed by the user's wireless system. This broad consensus of commenters noted that the record in this proceeding is wholly lacking in scientific support for these exacting and premature requirements. Wireless carriers and equipment manufacturers were unanimous in their opposition to the FNPRM ALI Requirements. In addition, these proposals did not receive support from even the majority of the developers of wireless location information technology, the companies with the most knowledge concerning the limitations and capabilities of current ALI technologies and the most to gain from a Commission mandate of ALI requirements. Significantly, KSI, the sole source of the Commission's "estimate" that the FNPRM ALI Requirements are feasible in the foreseeable future, opposed the Requirements and distanced itself from the Commission's reliance on its prior claims.

The minority of commenters which supported the Commission's proposals provided no scientific basis for their positions. They introduced no reliable data or studies demonstrating that these proposals will be feasible in the foreseeable future. Rather, these commenters merely restated their advocacy of the broadly-accepted goals of providing improved wireless 911 service and, like the Commission, made the unsubstantiated assumption that the proposals in the FNPRM will soon be attainable.

Without any support in the record and without the support of even the lone party upon which it based its proposals, the Commission should refrain from adopting a rule mandating the FNPRM ALI Requirements at this time. Until a sufficient factual basis supporting the FNPRM ALI Requirements is demonstrated, any rule adopted by the Commission imposing these Requirements would be extremely vulnerable to judicial challenge. Rather than risk invalidation of these rules and the resultant delay and confusion such invalidation would cause the industry and the public, the Commission should instead simply reiterate its goals of achieving major improvements in the quality and reliability of wireless 911 services. The FNPRM ALI Requirements should be expressed only as future goals rather than requirements.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of the Commission's Rules	)	CC Docket No. 94-102
To Ensure Compatibility with	)	RM-8143
Enhanced 911 Emergency Calling Systems	)	

REPLY COMMENTS OF NOKIA TELECOMMUNICATIONS, INC.

Nokia Telecommunications, Inc. ("Nokia") by its undersigned counsel and pursuant to Section 1.415 of the Rules of the Federal Communications Commission, 47 C.F.R. § 1.415, respectfully submits these Reply Comments in response to the Further Notice of Proposed Rule Making ("FNPRM") and the comments of other parties in the above-referenced proceeding.[1] As a major manufacturer of wireless handsets and infrastructure equipment, Nokia has a substantial interest in the outcome of this proceeding. On September 3, 1996, Nokia petitioned the Commission to reconsider certain aspects of the rules it adopted in the Report and Order in this proceeding.[2] On September 25, 1996, Nokia submitted Comments to the FNPRM urging the Commission not to adopt several of the proposals discussed in the FNPRM. These Reply Comments expand on Nokia's earlier Comments and demonstrate that the record in this proceeding support the same positions advocated by Nokia.

I. INTRODUCTION

In the FNPRM, the Commission proposed to increase significantly the accuracy and reliability requirements for wireless E911 automatic location information ("ALI") technology it

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[1] Report and Order and Further Notice of Proposed Rulemaking, FCC 96-264 (July 26, 1996) ("First R & O" or "Further Notice").

[2] See Nokia Petition for Reconsideration, September 3, 1996.

had adopted in the concurrently released Report and Order. In the Report and Order, the Commission mandated an accuracy standard of 125 meters and a reliability standard of 67 percent, within five years. In the FNPRM, the Commission proposed a far more stringent accuracy standard of 40 feet and a reliability standard of 90 percent and an additional requirement -- vertical location (collectively, the "FNPRM ALI Requirements").[3] In addition, the Commission requested comment on how to ensure the availability of basic 911 service for wireless customers by enabling mobile users to complete a 911 call without regard to the geographic availability of the system or the air interface technology standard used in the wireless network (the "multiple system access requirements").[4]

In its Comments, Nokia urged the Commission to refrain from mandating the exacting and unproven FNPRM ALI Requirements. In addition, Nokia urged the Commission to refrain from mandating the multiple system access requirements.

Nokia has reviewed the comments of other parties in this proceeding and notes that each commenting party supports the Commission's goals of improving the quality, reliability and availability of 911 services to the customers of wireless telecommunications providers. However, the majority of commenters opposed the Commission's proposals to increase the ALI requirements for E911 wireless services as proposed in the FNPRM and urged caution concerning the Commission's request for comment on the feasibility of access to 911 service via multiple mobile systems. Every wireless carrier and equipment manufacturer submitting

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[3] FNPRM, ¶ 138.

[4] Id., ¶ 148.

comments in this proceeding opposed the Commission's proposals. In fact, these proposals did not receive support even from the majority of the developers of wireless location information technology. Significantly, KSI, the sole source of the Commission's "estimate" that the FNPRM ALI Requirements are feasible in the foreseeable future, opposed the Requirements and distanced itself from the Commission's reliance on its prior claims. While commenters representing public safety agencies generally supported the Commission's proposals, these commenters merely offered support for the public policy goals of promoting more accurate and reliable wireless ALI requirements. They failed to offer any scientific data to support the Commission's proposals, however. Nokia also notes that all public safety agencies are convinced that implementing the FNPRM ALI Requirements within the timeframe suggested by the Commission is feasible.

In sum, the record before the Commission clearly lacks any factual basis to support the adoption of the FNPRM ALI Requirements and the multiple system access requirements at this time. Nokia agrees with those commenters who argue that from a public policy perspective, the FNPRM ALI Requirements are certainly desirable as a means of ensuring greater quality and reliability in 911 services for customers of wireless telecommunications service providers. As the record in this proceeding and the majority of comments submitted in response to the FNPRM demonstrate, however, the technological capability to implement the FNPRM ALI Requirements has not been developed and tested to the point where it is appropriate to issue rules on that subject. In the same vein, the Commission's request for comment on future multiple system access requirements is premature. Rather than mandate regulations which are unrealistic and which may in fact delay the implementation of attainable wireless E911 capabilities, the Commission should instead state that the FNPRM ALI Requirements and the multiple system

access requirements are long-term industry goals and allow the industry maximum flexibility to achieve these goals. As new wireless E911 services and technologies are developed and introduced to the public, the marketplace will dictate the pace of development of these important services in a more efficient manner than will be accomplished by premature regulatory mandates.

II. THE COMMENTS DO NOT SUPPORT THE PROPOSED MORE STRINGENT LOCATION INFORMATION TECHNOLOGY REQUIREMENTS

The clear majority of commenters opposed the more stringent FNPRM ALI Requirements. This opposition came not only from wireless carriers and manufacturers of wireless telecommunications equipment, but also from the majority of developers of wireless E911 technology. The broad consensus of commenters opposing the Commission's proposals in the FNPRM demonstrates a clear lack of factual support in the record of this proceeding for the Commission to mandate the onerous FNPRM ALI Requirements. Comments in support of these Requirements provided no factual data to bolster the Commission's proposals. Rather, these commenters and the Commission make the unsubstantiated assumption that the capability to achieve these requirements is imminently available.

A. All Wireless Carriers and Manufacturers Opposed the FNPRM ALI Requirements

Nokia agrees with the comments of wireless carriers and wireless equipment manufacturers that opposed the FNPRM ALI Requirements.[5] These commenters each note that

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[5] See Comments of AirTouch Communications, Inc. ("AirTouch") at 3; American Portable Telecom ("APT") at 2; AT&T Wireless Services ("AT&T") at 2-3; Bell Atlantic Nynex Mobile ("BANM") at 2-3; E.F. Johnson Company ("E.F. Johnson") at 3; Ericsson, Inc. ("Ericsson") at 2-4; Lucent Technologies, Inc. ("Lucent") at 3; Omnipoint Communications, Inc. ("Omnipoint") at 1; GTE Service Corporation ("GTE") at 4; Southwestern Bell Mobile Systems ("SBMS") at 5. See also Comments of Personal

the proposed requirements are premature,[6] have not been adequately tested,[7] may actually delay the development of workable wireless E911 systems[8] and lacked a sufficient basis in the record to support adoption.[9]

Several commenters correctly urged the Commission to await the results of field trials and the actual deployment of the 125 meter, 67 percent standard adopted in the Report and Order before mandating even more stringent ALI requirements.[10] These commenters advocated the logical progression and development of standards from which manufacturers, carriers and public safety agencies can learn rather than immediate implementation of the "quantum leap" in ALI standards proposed by the Commission. Lucent urged the Commission not to adopt *a priori* arbitrary requirements but instead to evaluate statistically relevant data from Phase II systems and use this data "for developing an appropriate further standard for both radius and

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Communications Industry Association ("PCIA") at 4-5; Cellular Communications Industry Association ("CTIA") at 3-4.

[6] See Comments of AirTouch at 3.

[7] See Comments of AT&T at 2, n.4; Lucent at 3-5; SBMS at 4-5. *See also*, Comments of Associated RT, Inc. ("ART") at 26.

[8] See, Comments of BANM at 3. See also, Comments of KSI at 6; ART at 6; Raytheon at 1-2.

[9] See Comments of BANM at 4; Ericsson at 2.

[10] As noted, Nokia petitioned the Commission to reconsider the adoption of the 125 meter, 67 percent location requirements. See Nokia Petition for Reconsideration. While Nokia continues to believe that these requirements are premature and should be reconsidered by the Commission, if they are ultimately adopted, the Commission should allow these standards to be developed and fully implemented before mandating more exacting and unproven standards.

reliability."[11] Associated RT, Inc., a developer of wireless location technology, argued that further location requirements should be proposed only if, after evaluating the results of the requirements adopted in the Report and Order, the emergency services community decides that they would make a dramatic difference in location success.[12] Nokia supports these comments and urges the Commission to promote the development of wireless E911 technology as the pace of technology dictates rather than by premature regulatory mandates.

B. The FNPRM ALI Requirements Were Opposed by the Majority of Wireless ALI Technology Developers, Including KSI, the Commission's Sole Source for its Estimate That the Requirements Are Feasible in the Foreseeable Future

The majority of developers of wireless ALI technology commenting in this proceeding opposed the FNPRM ALI Requirements. Harris Government Communications Systems Division ("Harris-GCSD"), an experienced developer of wireless tracking and location systems, stated in its comments "that the proposed standard of 90 percent accuracy, within a radius of 40 feet is unrealistic and impractical given the current ALI technology and will remain so for the foreseeable future."[13] Raytheon E-Systems ("Raytheon"), another developer of location technologies, opposed the Commission's proposed requirements, stating that the suggestion of increasing the accuracy requirements would have the effect of delaying investment in location technology and consequently reduce the opportunities for advancing the state of the art.[14]

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[11] See Comments of Lucent at 5.

[12] See Comments of ART at 12.

[13] See Comments of Harris-GCSD at 4.

[14] See Comments of Raytheon E-Systems at 1.

Raytheon recommended that the Commission defer any rulemaking on increased accuracy requirements until such time as the industry realistically can be expected to achieve such requirements.[15] Associated RT, Inc. ("ART"), which has been active in the development of E911 location systems, also opposed the Further Notice Requirements:

> ART has serious concerns that a number of the changes proposed by the Commission in the Further Notice will not promote, and may actually delay the delivery of the very services strongly supported by the Commission in the Report and Order. In particular, by proposing several changes to the accuracy standard, the Commission will divert attention and resources away from systems that already meet, or are currently in development to meet, the 410 foot, 67-percent requirement of the Report and Order. Furthermore, the existence of conflicting multiple standards, even the ongoing discussion of multiple standards (i.e. 410-foot, 67-percent; 410-foot, 90-percent; 40-foot, 90-percent), will serve to confuse both developers and carriers, and may create stagnation rather than enthusiasm in the efforts to proceed with near-term implementation of nationwide delivery of wireless 'E911'.[16]

Thus the majority of developers of E911 location technology commenting in this proceeding -- the very companies who have both the most knowledge concerning the limitations and capabilities of current ALI technologies and the most to gain from a Commission mandate of ALI requirements,[17] oppose the more stringent requirements proposed by the Commission. In addition, and most significantly, KSI, whose earlier claims served as the cornerstone of the Commission's proposals in the FNPRM, has made it clear that it does not support the more stringent requirements proposed by the Commission.

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[15] Id. at 2.

[16] Associated RT, Inc. Comments at 3-4 (emphasis in original).

[17] See, e.g., Comments of SBMS at 6.

1. In Light of KSI's Opposition to the FNPRM ALI Requirements and the Clear Lack of Support for the Requirements in the Record of This Proceeding, the Commission Should Withdraw its Proposal or Risk Having any Rules Adopted be Invalidated

As noted, the Commission based its estimate that the FNPRM ALI Requirements were achievable entirely on the statements of KSI.[18] Yet in its comments, KSI refutes any claim that its technology or any other manufacturer's technology can meet the FNPRM ALI Requirements:

> KSI did not and does not aver that implementing its system, or any other system, can economically provide locational accuracy to within a radius of 40 feet, 90 percent of the time, in all environments . . . Furthermore, the Commission's proposal regarding three-dimensional, 40 foot accuracy will not be economically feasible in many operational environments . . . In addition to economic and operational difficulties, KSI is concerned about the chilling effect that a proposal to adopt a "standard of 90 percent accuracy, within a radius of 40 feet, at the end of the initial five-year period" will have on the adoption of the currently mandated 125 meter, 67 percent accuracy requirement. Carriers may decide to do nothing unless and until they know for certain what standard/requirement they must meet and by when . . . The Commission should establish standards and requirements based on what is obtainable and affordable . . . Such a mandated standard may result in more harm than good since it is not economically achievable in the marketplace, leading to divisiveness in the regulatory arena.[19]

Thus KSI, the Commission's sole source for its "estimate" that the FNPRM ALI Requirements would be available within five years, contradicts the view that the information submitted by KSI in the record of this proceeding supports the more stringent FNPRM ALI Requirements. In short, the FNPRM ALI Requirements lacked a sufficient factual basis in the

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[18] FNPRM, ¶ 139. The Commission cites no source which supports its estimate other than KSI's Reply Comments filed in response to the original NPRM. Even in these Reply Comments, KSI only claimed to be able to provide "an 86.47 % probability of containment" for the 125 meter location requirement, not the 40 foot accuracy requirement proposed in the FNPRM. KSI Reply Comments at 5.

[19] Comments of KSI at 6-7 (emphasis added).

record of this proceeding to support a rulemaking.[20] This was true even when it was assumed that the Commission had the support of KSI, the very entity which provided the basis for its "estimate." There is no question now, however, that KSI's comments leave the Commission with no factual support in the record for its proposal to mandate the FNPRM ALI Requirements. Without the support of KSI, or indeed, any other evidence in the record supporting the feasibility of the FNPRM ALI Requirements, the Commission is engaged in purely predictive rulemaking.

2. Adoption of the FNPRM ALI Requirements Would Violate Fundamental Principles of Administrative Law and Would be Extremely Vulnerable to Judicial Challenge

As confirmed by KSI's comments, the Commission's "estimate" that the FNPRM ALI Requirements are achievable is entirely lacking in record support in this proceeding. By basing its proposed rules on such an inadequate factual record, the Commission is engaged in purely predictive rulemaking. If challenged, rules based on pure speculation by an agency with no factual basis in the record are likely to be invalidated by a reviewing court. While an agency may utilize a predictive model in promulgating regulations, Natural Resources Defense Council, Inc. v. Herrington, 768 F.2d 1355, 1385 (D.C. Cir. 1985), it must explain the assumptions and methodology used in preparing the model, Eagle-Pricher Industries, Inc. v. United States Envtl. Protection Agency, 759 F.2d 905, 921 (D.C. Cir. 1985), and if the model is challenged, it must provide a full analytical defense. Id. Here, the Commission lacks the tools and the data to construct such a defense. Where no record evidence exists to support the adoption of a rule, a court will find the rule arbitrary and capricious because the agency will be unable to articulate

[20] Nokia Comments at 3-4; Comments of BANM at 4.

a satisfactory explanation for adopting the rule and will be unable to provide a rational connection between the facts found and the choice made. Menorah Medical Center v. Heckler, 768 F.2d 292, 295 (8th Cir. 1985). With no support in the record for a rule, an agency cannot be said to have "examined the relevant data and articulate[d] a reasoned basis for its decision," sufficient for a reviewing court to accord the agency deference in judicial review. Herrington, 768 F.2d at 1385.

Moreover, where an agency relies on faulty data in promulgating a rule, such reliance is a basis for finding that the rule was issued in an arbitrary manner. Almay, Inc. v. Califano, 569 F.2d 674 (D.C. Cir. 1977) (standard adopted by the Commissioner of the Food and Drug Administration was held invalid because the Commissioner relied on a faulty survey in setting the standard and had been put on notice that the survey was faulty); Lloyd Noland Hosp. and Clinic v. Heckler, 619 F.Supp. 1 (D. Ala. 1984). In Lloyd Noland Hospital, a rule regarding malpractice premium reimbursements was held invalid because, *inter alia*, the rule was adopted by the Department of Health and Human Services after the author of a study upon which the rule was based warned the agency that the study was flawed and should not be relied upon to promulgate a regulation. Id. at 10. In this proceeding, the Commission is faced with precisely the same circumstances: having relied on KSI's views in proposing the FNPRM ALI Requirements, the Commission has now been put on notice that KSI disagrees with the Commission's proposals. If the Commission, nonetheless, proceeds to adopt a rule based on its knowingly faulty "estimate" that such requirements are attainable, such a rule, like the rule in Lloyd Noland Hospital, is almost certain to be held invalid. Rather than mandate standards for which there is no factual support in the record, the Commission should instead reiterate its goals

of achieving major improvements in the quality and reliability of wireless 911 services. The FNPRM ALI Requirements should be expressed only as future goals, to be considered as requirements only when technological developments advance to the point that they are feasible.

C. Comments Supporting the FNPRM ALI Requirements Failed to Demonstrate Adequate Support in the Record for the Proposals

Commenters supporting the FNPRM ALI Requirements failed to provide adequate data or testing results demonstrating that these requirements will be achievable in the foreseeable future. Nokia notes that at least one public safety organization questioned the feasibility of the Commission's proposals in the FNPRM.[21] This commenter, the Texas Advisory Commission on State Emergency Communications ("TX-ACSEC"), addressing the FNPRM ALI Requirements "recognize[d] that before implementation of Phase I has even begun, sufficient information may not yet exist to determine definitively the reasonableness of each of the expanded standards and requirements or to determine definitively the costs. The Commission, nevertheless, should still adopt the expanded standards and requirements as goals."[22]

Other commenters which supported the FNPRM ALI Requirements provided no scientific basis for their positions. Rather, these commenters merely restated their advocacy of the broadly-accepted goals of providing more accurate and reliable wireless 911 service and joined the Commission in assuming that these advanced services will be feasible in the foreseeable future. Indeed, in joint comments, the International Association of Fire Chiefs, Inc. ("IAFC")

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[21] See, e.g., Comments of the Texas Advisory Commission on State Emergency Communications ("TX-ACSEC") at 2.

[22] Id. (emphasis added).

and the International Municipal Signal Association ("IMSA") specifically acknowledged the dearth of scientific and testing data in the record of this proceeding to support the Commission's proposals.[23] The common denominator linking all supporters of the FNPRM ALI Requirements is reliance upon an assumption that achieving these Requirements within the required timeframe is feasible in the foreseeable future. Those commenters supporting these Requirements provided no facts or data to bolster the Commission's proposals. A rule, however, cannot rest upon a mere assumption where there is not a scintilla of reliable scientific support for it.

III. THE COMMISSION'S PROPOSAL THAT WIRELESS CALLERS HAVE ACCESS TO MULTIPLE MOBILE SYSTEMS IS UNREALISTIC AND WAS NOT SUPPORTED BY THE COMMENTS

Nokia urges the Commission to refrain from mandating any common air interface standard for the purposes of wireless E911 caller location. A majority of commenters also urged the Commission to act cautiously in this area. Nokia agrees with the comments of the Personal Communications Industry Association ("PCIA") that the Commission's proposal to require 911 access to any wireless customer without regard to the air interface technology of the customer's system is "fundamentally at odds" with its decision not to mandate a technical standard for PCS and digital cellular service.[24]

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[23] See Comments of IAFC and IMSA at 3-4. Significantly, these commenters cite the claims of KSI as the only record support for the Commission's proposals. Id. at 4, n.3.

[24] See Comments of PCIA at 12-13. See also, Comments of Omnipoint at 4-5; Ericsson at 5; E.F. Johnson at 6.

As pointed out by Omnipoint Communications, Inc., "the current plethora of incompatible technologies" would require the Commission to "embark on a largely unworkable plan to achieve its suggested requirement for access to 911 service via multiple mobile systems."[25] Any such plan would face a myriad of technical and regulatory issues which the Commission would need to address prior to mandating such a requirement.[26] These issues were echoed in the comments of Ericsson which stated that the proposal cannot be implemented at this time "because the wireless industry is operating in a competitive environment that is not conducive to achieving interoperability with regard to the full panoply of digital standards that exist in the marketplace."[27]

Nokia notes that the joint comments of the Association of Public-Safety Communications Officials-International, Inc. ("APCO"), the National Emergency Number Association ("NENA") and the National Association of Nine One One Administrators ("NASNA") (the "Joint Commenters") recognize the immense technical problems associated with the Commission's proposal. The Joint Commenters, while supporting a requirement that 911 callers be able to reach the strongest available signal (i.e., the strongest signal using the same basic technology and frequency range as the caller's home carrier), would not support a requirement which would compel customers of carriers operating on different air interface standards to have multi-mode handsets. Rather, the Joint Commenters urge the Commission to monitor technological and marketplace developments and revisit this issue at an appropriate time in the future. Such an

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[25] See Comments of Omnipoint at 6.

[26] Id. at 7-9.

[27] See Comments of Ericsson at 5.

approach is consistent with that proposed by Nokia and other wireless equipment manufacturers and wireless carriers. While the industry will develop the capability for all handsets to be interoperable, such technology does not exist today. It is therefore far too early to even propose an interoperability requirement at this time. The Commission should continue to adhere to its commendable decision to allow the market to set technical standards for PCS and digital wireless service.

IV. CONCLUSION

For the foregoing reasons, Nokia urges the Commission to refrain from mandating increased wireless E911 ALI requirements and from proposing any interoperability requirements for wireless E911. The record is wholly lacking in factual support for the Commission's proposal in the FNPRM to increase the location information standards. Moreover, KSI, the sole party upon whose claims the Commission based its estimate that the proposed standards were achievable, has, in its comments, disclaimed any connection between its claims and the feasibility of the Commission's proposals. Thus, until a sufficient factual basis supporting the FNPRM ALI Requirements exists, any rule adopted by the Commission imposing the requirements would be arbitrary and capricious. Similarly, nothing in the record supports the proposal to require wireless carriers to provide 911 service to all callers, regardless of the technology employed by the caller's system. In fact, the record clearly demonstrates that such a capability, while desirable as a matter of public interest, will not be feasible for the foreseeable future. Rather than mandate an interoperability standard for CMRS carriers, the Commission

should be consistent with its earlier well-reasoned decision to allow the market to dictate which wireless technology standards ultimately survive.

Respectfully submitted,

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October 25, 1996

CERTIFICATE OF SERVICE

I, Tina Harris, a secretary with the law firm of Verner, Liipfert, Bernhard, McPherson and Hand, hereby certify that on this 25th day of October, 1996, a copy of Reply Comments of Nokia Telecommunications, Inc. was mailed, first class postage prepaid to the following:

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